UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/554,218	10/24/2005	Katsuya Okumura	279585US0XPCT	8263

22850 7590 12/11/2007

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
BHAT, NARAYAN KAMESHWAR	

ART UNIT	PAPER NUMBER
1634	

NOTIFICATION DATE	DELIVERY MODE
12/11/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/554,218	OKUMURA ET AL.	
	Examiner	Art Unit	
	Narayan K. Bhat	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) *32-46* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10/24/2005, 4/2/2007 & 10/18/2007.

DETAILED ACTION

Election/Restrictions

1. Claims 1-46 are pending in this application.

2. Applicant's election with traverse of Group I invention in the reply filed on October 15, 2007 is acknowledged. The traversal is on the grounds that the examiner has not considered that the claims in each group are related inventions under 37 C.F. R. § 1.475 (b) in which the inventions are considered to have unity of invention and there would be serious burden on the Examiner. These arguments are not found persuasive because, 37 C.F. R. § 1.475 (a) recite "An international and a national stage application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention"). Where a group of inventions is claimed in an application, the requirement of unity of invention shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression "special technical features" shall mean those technical features that define a contribution which each of the claimed inventions, considered as a whole, makes over the prior art". As described in the previous office action, Groups I, II and III do not relate to a single general inventive concept, because the instant 371 national stage application were found to lack unity of invention (where unity of invention requires a special technical feature) due to the lack of a special technical feature between the different groups. Since there is a lack of unity between groups I, II and III, the burden of the search of these different inventions is moot.

The requirement is still deemed proper and is therefore made FINAL.

3. Claims 32-46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention of group II and III there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 15, 2007.

4. It is noted that claims 30 and 31 belong to Group I invention and was an oversight on the part of the examiner that said claims were not listed in Group I. Claims 30 and 31 are examined along with other claims in group I.

5. Claims 1-31 are under prosecution.

6. The examiner for this application has changed. Please address future correspondence to Examiner Narayan K. Bhat, Art Unit 1634.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 13-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 13 is indefinite over the recitation of "a dispersion with probe-supported particles dispersed therein is placed in said well(s)" because it is not clear whether the "probe supported particles" are the structural component of the biochip or for intended

use of the biochip.

10. Claims 14-21 are indefinite because they are dependent from claim 13.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-2, 4-11 and 22-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Beattie (USPN 5,843,767 issued on Dec.1, 1998).

Regarding claim 1, Beattie teaches a microfabricated device for detecting nucleic acids that includes arrays of wells containing discrete channels at the bottom of the well (Fig. 1A and 1B, column 9, lines 1-8, Fig. 3, Example 3, columns 5, 6, 9 and 11, lines 25-67, 1-67, 16-18 and 24-49) and further teaches that channels arranged across a surface of substrate and extending through a second surface of said substrate, thereby forming straight channels, i.e., straight pores (column 6, lines 45-48). Beattie also teaches that pores are of about 50 micron in diameter with spacing between adjacent pores of about 150 microns thus teaching pores with a uniform diameter arranged at uniform pore spacing. The well with pores at its bottom of Beattie is the filter of the instant claim. Beattie also teaches that the microfabricated device detects biomolecules (Figs. 5 and 6, column 6, lines 43-54). Since there is no limiting definition for the

biochip, the microfabricated device detecting biomolecules is interpreted as the biochip of the instant claim.

Regarding claim 2, Beattie teaches a device wherein filter has a thickness of about 10 microns (column 6, lines 7-13).

Regarding claim 4, Beattie teaches a device, wherein the surface of the filter is formed of silicon dioxide, i.e., silica (column 13, lines 41-44).

Regarding claim 5, Beattie teaches a device that includes a plurality of said wells provided integrally with each other (Fig. 3).

Regarding claim 6, Beattie teaches a device that also contains many single wells (Fig. 3).

Regarding claim 7, Beattie teaches a device with a support structure, i.e., reinforcing rib provided on the lower side of the filter (Fig. 3, structure without the hatches, for example, the one in- between the oval shaped structure and hatched structure). In an another embodiment, Beattie teaches arrays of wells are bonded on the upper side to a polymeric layer and arrays and polymeric layer are laminated together to provide physical support to the fragile array (Example 2, columns 10 and 11, lines 32-67 and 1-53) thus providing reinforcing rib part on the upper side or lower side of the well to provide strength to the filter as defined in the instant specification (paragraph 0182).

Regarding claim 8, Beattie teaches that the support structure is of integral type provided with a plurality of wells (Fig. 3, structure without the hatches below the hatched structure, which is marked Si). In an another embodiment, Beattie teaches arrays of wells are bonded on the upper side to a polymeric layer and arrays and polymeric layer

are laminated together to provide physical support to the fragile array (Example 2, columns 10 and 11, lines 32-67 and 1-53) thus providing reinforcing rib part is of an integral type provided with a plurality of through holes.

Regarding claim 9, Beattie teaches that reinforcing structure is joined directly to filter (Fig. 3, structure without the hatches below the hatched structure, which is marked Si). In an another embodiment, Beattie teaches arrays of wells are bonded on the upper side to a polymeric layer and arrays and polymeric layer are laminated together to provide physical support to the fragile array (Example 2, columns 10 and 11, lines 32-67 and 1-53) thus providing reinforcing rib part joined directly to the filter.

Regarding claim 10, Beattie teaches that the supporting structure is underneath the nonporous part free from pore and continually extends from the same filter (Example 3, Fig. 3, structure without the hatches below the hatched structure, which is marked Si). In an another embodiment, Beattie teaches arrays of wells are bonded on the upper side to a polymeric layer and arrays and polymeric layer are laminated together to provide physical support to the fragile array (Example 2, columns 10 and 11, lines 32-67 and 1-53) thus providing reinforcing rib part is formed of an identical material.

Regarding claim 11, Beattie teaches a device wherein a nonporous part free from pores of said filter is provided on the bottom of said well in a predetermined width from the periphery of said well (Fig. 3, Example 3, columns, 11-13).

Regarding claim 22, Beattie teaches a device that includes a chamber connected to a wafer substrate via assembly (Fig. 2, column 9, lines 10-15) and said wafer

contains wells with pores to which biomolecules are attached to detect biomolecules (Examples 3 and 10), i.e., a biochip. The chamber of Beattie is the vessel of said claim. Since Beattie teaches both vessel and biochip, it is a biochip kit as defined in the instant specification (paragraph 0291).

Regarding claim 23, Beattie teaches a biochip kit in that includes a vessel integrated with wells via assembly (Fig. 2).

Regarding claim 24, Beattie teaches a biochip kit which is packaged in a chamber (Fig. 2, column 9, lines 10-11), thus teaching chamber, i.e., vessel is formed independently of biochip wells.

Regarding claim 25, Beattie teaches a biochip kit wherein vessel is provided with upper reservoir, i.e., a vessel corresponding to wells in the biochip (Fig. 4, column 9, lines 9-15). It is noted that the claim does not require well of the vessel in one on one relationship with the wells of the biochip.

Regarding claim 26, Beattie teaches a biochip kit wherein through-hole is provided at the bottom of vessel well (Fig. 4, hole is labeled as "vacuum out").

Regarding claim 27, Beattie teaches a biochip kit that includes upper reservoir, i.e., a vessel integrated with wells of the biochip via assembly so that the corresponding wells are connected to each other (Fig. 4). It is noted that the claim does not require well of the vessel in one on one relationship with the wells of the biochip.

Regarding claim 28, Beattie teaches a biochip kit wherein upper reservoir plate, biochip plate and lower chamber plate stacked on top of each other and further teaches that lower chamber plate has no holes whereas biochip plate has holes (Fig. 4).

Regarding claim 29, Beattie teaches a biochip kit wherein each well contains different biomolecules that is plurality of biochips and further teaches a ultrahigh density of microfabricated device (Example 10, Fig. 5d) thus teaching a plurality of biochips which are connected to each other so that the corresponding wells are connected to each other.

Regarding claim 30, Beattie teaches a biochip kit wherein the flat part of the lower chamber, i.e., a vessel well provided on the lower end of the well side part of biochip. Beattie also teaches that flat part of the upper reservoir, i.e., upper end of the well side is connected to each other via assembly (Fig. 4, column 9, lines 9-15).

Regarding claim 31, Beattie teaches a biochip kit wherein the upper and lower chambers are assembled with the biochip using the Derlin O ring which has convex and concave part, thus teaching a positioning concave part into which a convex part provided on the upper end of the well side part in said separate vessel (Fig. 4, column 9, lines 20-23).

13. Claims 1, 4-6, 13-14 and 16-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Weiner et al (USPGPUB NO. US 2003/0096268 published May 22, 2003).

Regarding claim 1, Weiner et al teaches an apparatus that includes microreactor vessels having at its bottom an inorganic membrane filter with 0.2 micron channels, i.e., pores (Fig. 2, paragraph 0069) and further teaches that the filter is from Whatman PLC sold under the brand name Anopore, which has parallel microchannels (paragraph

0069) which is a straight pore filter with a uniform diameter arranged at uniform pore spacing. Weiner et al also teaches that the apparatus is a DNA sequencing apparatus (paragraph 0058). Since there is no limiting definition for the biochip, the apparatus of Weiner et al is interpreted as the biochip of the instant claim.

Regarding claim 4, Weiner et al teaches that the surface of the filter is formed of alumina (paragraph 0069).

Regarding claim 5, Weiner et al teaches a confined membrane reactor array (CMRA) that includes a plurality wells provided integrally with each other (Fig. 2, paragraph 0046).

Regarding claim 6, Weiner et al teaches an unconfined membrane reactor array that includes a single well (Fig. 7, paragraphs 0051 and 0066).

Regarding claim 13, Weiner et al teaches that the CMRA contains mobile solid support, i.e., particles immobilized with nucleic acids, that is probes thus teaching probe-supported particles dispersed therein is placed in said wells (paragraph 0030).

Regarding claim 14, Weiner teaches an embodiment wherein the beads are 40 micron and the membrane pore diameter is of 30 micron that meets the limitation of the ratio between the diameter of said particles and the pore diameter of said filter is particle diameter/pore diameter=1.1 to 2.5 (paragraph 0174). It is noted that the particle size relative to pore spacing has less bearing on the patentability of the claim.

Regarding claim 16, Weiner et al teaches beads conjugated with nucleic acid sequence, i.e., probe-supported particles and is the identification means for providing probe identification information (Example 1, paragraph 0170).

Regarding claim 17, Weiner et al teaches that the well contains 10 million beads and each bead has 3 million copies of nucleic acid probes (paragraphs 0170-0171 and 0174) and the gene sequence is the identification means of the probe-supported particle (Example 1, paragraph 0170).

Regarding claim 18, Weiner et al teaches that well contains 10 million beads and each bead has 3 million copies of same nucleic acid probes (Example 1, paragraphs 0170-0171 and 0174), thus teaching a plurality of probe-supported particles which are identical to each other in nucleic acid sequence, thus plurality of probe supported particles are identical information.

Regarding claim 19, Weiner et al teaches that well contains 10 million beads and each bead has 3 million copies of same nucleic acid probes (Example 1, paragraphs 0170-0171 and 0174), but contain A, G, C and T nucleotides and therefore probe identification information are different from each other in said probe identification information for a plurality of probe-supported particles contained therein.

Regarding claim 20, Weiner teaches an embodiment wherein the reagent immobilized on the mobile solid support, i.e., particles have are different polypeptides with different enzyme activity thus teaching a plurality of probe-supported particles which are different from each other in probe identification information in said at least enzyme activity identification means are contained in an identical well and said wells are identical to each other in construction of said probe identification information in all the identification means for a plurality of probe-supported particles contained therein (paragraph 0164).

Regarding claim 21, Weiner teaches an embodiment wherein the reagent immobilized on the mobile solid support, i.e., particles have are different polypeptides with different enzyme activity and further teaches a fusion protein with luciferase and sulfurylase activity and other mobile solid support with lucifease activity thus teaching a plurality of probe-supported particles which are different from each other in probe identification information in said at least enzyme activity identification means are contained in an identical well and said wells are different from each other in construction of said probe identification information (one with a polypeptide and another with fusion polypeptide) in at least one of said identification means for a plurality of probe-supported particles contained therein (paragraph 0164).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beattie (USPN 5,843,767 issued on Dec.1, 1998).

Regarding claim 1, Beattie teaches a microfabricated device for detecting nucleic acids that includes arrays of wells containing discrete channels at the bottom of the well (Fig. 1A and 1B, column 9, lines 1-8, Fig. 3, Example 3, columns 5, 6, 9 and 11, lines 25-67, 1-67, 16-18 and 24-49) and further teaches that channels arranged across a surface of substrate and extending through a second surface of said substrate, thereby forming straight channels, i.e., straight pores (column 6, lines 45-48). Beattie also teaches that pores are of about 50 micron in diameter with spacing between adjacent pores of about 150 microns thus teaching pores with a uniform diameter arranged at uniform pore spacing. The well with pores at its bottom of Beattie is the filter of the instant claim. Beattie also teaches that the microfabricated device detects biomolecules (Figs. 5 and 6, column 6, lines 43-54). Since there is no limiting definition for the biochip, the microfabricated device detecting biomolecules is interpreted as the biochip of the instant claim.

Regarding claim 3, Beattie teaches a device wherein the array region is of about 100 um diameter with spacing between the array regions of 500 um, ratio of pore diameter/ spacing, which is 20%, that meets the limitation of the claim (column 5, lines 58-65). Since there is no limiting definition of open area ratio in the instant specification, the claim is interpreted broadly. Beattie also teaches array density of 400 to 4400

regions per cm2 area (columns 5 and 6, lines 65 and 6) thus teaching different open area ratios and therefore would be obvious to one of ordinary skill in the art at the time the invention was made to have a biochip with different open area ratio to optimize the filtration rate for increasing the sensitivity of the target detection (columns 1 and 2, lines 40-67 and 1-30).

17. Claims 1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beattie (USPN 5,843,767 issued on Dec.1, 1998) in view of Chafin et al (USPGPUB NO. US 2003/0109031 published June 12, 2003).

Regarding claim 1, Beattie teaches a microfabricated device for detecting nucleic acids that includes arrays of wells containing discrete channels at the bottom of the well (Fig. 1A and 1B, column 9, lines 1-8, Fig. 3, Example 3, columns 5, 6, 9 and 11, lines 25-67, 1-67, 16-18 and 24-49) and further teaches that channels arranged across a surface of substrate and extending through a second surface of said substrate, thereby forming straight channels, i.e., straight pores (column 6, lines 45-48). Beattie also teaches that pores are of about 50 micron in diameter with spacing between adjacent pores of about 150 microns thus teaching pores with a uniform diameter arranged at uniform pore spacing. The well with pores at its bottom of Beattie is the filter of the instant claim. Beattie also teaches that the microfabricated device detects biomolecules (Figs. 5 and 6, column 6, lines 43-54). Since there is no limiting definition for the biochip, the microfabricated device detecting biomolecules is interpreted as the biochip of the instant claim.

Regarding claim 12, Beattie teaches a biochip that includes a filter at the bottom of the well (Fig. 4, biochip is in the middle) but does not teach the filter on top of the well so that wells are sandwiched between the two filters. However, filter on top of the well was known in the art before the invention was made as taught by Chafin et al who teaches a device for detecting target in a sample that includes a filter between pretreatment chamber and the first chamber (Fig. 3C, filter # 118, pretreatment chamber # 114, first chamber # 122, paragraph 0041-0042) and further teaches that the pretreatment chamber is for lysing cells and the first chamber is for collecting partially purified nucleic acids for detecting the target on a detection card (paragraph 0039-0042). Chaffin also teaches the filter is used to collect samples and for removing cellular debris for direct analysis of target in the samples (paragraphs 0042-0045).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the filter of Chafin et al in the device of Beattie et al with the expected benefit of collecting the samples and for removing cellular debris for direct analysis of the target in the sample as taught by Chaffin et al (paragraphs 0042-0045). The combined teachings of Beattie et al and Chafin et al, thus provides two filters one on the top of the well to collect sample without any cellular debris and directly using the sample to identify the target with the filter at the bottom of the well thus sandwiching the well between two filters.

18. Claims 1, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weiner et al (USPGPUB NO. US 2003/0096268 published May 22, 2003).

Regarding claim 1, Weiner et al teaches an apparatus that includes microreactor vessels having at its bottom an inorganic membrane filter with 0.2 micron channels, i.e., pores (Fig. 2, paragraph 0069) and further teaches that the filter is from Whatman PLC sold under the brand name Anopore, which has parallel microchannels (paragraph 0069) which is a straight pore filter with a uniform diameter arranged at uniform pore spacing. Weiner et al also teaches that the apparatus is a DNA sequencing apparatus (paragraph 0058). Since there is no limiting definition for the biochip, the apparatus of Weiner et al is interpreted as the biochip of the instant claim.

Regarding claim 13, Weiner et al teaches that the confined membrane reactor array (CMRA) contains mobile solid support, i.e., particles immobilized with nucleic acids, that is probes thus teaching probe-supported particles dispersed therein is placed in said wells (paragraph 0030).

Regarding claim 15, Weiner teaches an embodiment wherein the beads are 40 micron and the membrane pore diameter is of 30 micron that meets the limitation of the ratio between the diameter of said particles and the pore diameter of said filter is particle diameter/pore diameter=1.1 to 2.5 (paragraph 0174). Weiner does not teach the relationship between, particle size and pore diameter and pore spacing to meet the limitation of the formula.

However, In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984),cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative

dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device (MPEP 2144.04).

Weiner teaches that the pressure difference across the CMRA wells is prevented by introducing fluid via multiple inlets to maintain uniform flow in each wells (paragraph 0112) and therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the particle size and pore diameter and pore spacing as an alternative means to maintain the uniform flow in all the wells.

Conclusion

19. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Narayan K. Bhat whose telephone number is (571)-272-5540. The examiner can normally be reached on 8.30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram R. Shukla can be reached on (571)-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

(NK BHAT)

Narayan K. Bhat, Ph. D.

Examiner

Art Unit 1634

BJ FORMAN, PH.D.
PRIMARY EXAMINER